



# SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:  
EP 17 87 27 17

**Classification of the application (IPC):**  
H01L 21/60, H01L 23/48, H01L 23/13, H01L 23/498

**Technical fields searched (IPC):**  
H01L

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	TW 201342538 A (ADVANCED SEMICONDUCTOR ENG [TW]) 16 October 2013 (2013-10-16) * paragraphs [0010] - [0015]; figures 1,2,8 *	1, 2
X	JP S52149066 A (HITACHI LTD) 10 December 1977 (1977-12-10) * cf. figures 5 and 6 in conjunction with the corresponding text.;figures 5,6 *	1, 3
X	JP S6324838 U (ADVANCED SEMICONDUCTOR ENGINEERING , INC) 18 February 1988 (1988-02-18) * cf. figures 1a-1c in conjunction with the corresponding text.;figures 1a-1c *	1, 3
X	JP 2002198638 A (SHINKO ELECTRIC IND CO) 12 July 2002 (2002-07-12) * paragraphs [0037] - [0043]; figures 7(c)(d), 8 (a)-(c), *	1, 2, 5, 6
X	JP H1117326 A (MATSUSHITA ELECTRIC WORKS LTD) 22 January 1999 (1999-01-22) * paragraphs [0006], [0049] - [0052]; figures 9 (A), 9 (B),9 (C) *	1, 2, 5, 6

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search	Date of completion of the search	Examiner
Munich	22 October 2020	Ahlstedt, Mattias

## CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone  
 Y: particularly relevant if combined with another document of the same category  
 A: technological background  
 O: non-written disclosure  
 & : member of the same patent family, corresponding document

P: intermediate document  
 T: theory or principle underlying the invention  
 E: earlier patent document, but published on, or after the filing date  
 D: document cited in the application  
 L: document cited for other reasons



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### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3

directed to that at least one of the conductive traces extends onto an edge of an upper surface of the solid circuit die, and is in direct contact with an edge portion of one contact pad on the upper surface of the solid circuit die.

2. claim: 4

directed to that at least one of the channels extends into the pocket with the first end being underneath the solid circuit die.

3. claims: 5, 6

directed the channels comprise an inlet channel and an outlet channel each extending into the pocket and having the respective first ends fluidly connected inside the pocket to form an inner channel, at least a portion of the inner channel being underneath the solid circuit die.

4. claims: 7, 8

directed to the substrate further comprises one or more safety channels disposed adjacent to at least one of the channels, the safety channels each extend across a side wall of the pocket in a direction substantially parallel to the adjacent channel.

5. claims: 9-11

directed to that either that at least one of the pockets includes a sloped sidewall, and at least one of the channels extends across the sloped sidewall, or that there is a gap between edges of the pocket and the solid circuit die, the gap being at least 3 times greater than a required tolerance.

6. claims: 12-15

directed a method involving the step of disposing a conductive liquid at the second ends of the channels; flowing the conductive liquid, primarily by a capillary pressure, in the channels toward the first ends to make direct contact with the contact pads of the solid circuit die; and solidifying the conductive liquid to form.

Only part of the further search fees have been paid within the fixed time limit. The present (supplementary) European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims: 1-3, 5, 6

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

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## ANNEX TO SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on 22-10-2020  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
TW 201342538	A	16-10-2013	NONE		
JP S52149066	A	10-12-1977	JP	S5724929 B2	26-05-1982
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			JP	S6324838 U	18-02-1988
JP 2002198638	A	12-07-2002	NONE		
JP H1117326	A	22-01-1999	JP	4117807 B2	16-07-2008
			JP	H1117326 A	22-01-1999